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10/757,055	01/14/2004	Kevin E. Spaulding	87433RLO	4831

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/757,055	SPAULDING ET AL.
	Examiner	Art Unit
	Max Shikhman	2624

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08/15/2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-27</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-27</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>06/30/2007</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>1/29/2007</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   Office Action Summary   Part of Paper No./Mail Date 20070123

DETAILED ACTION

1. RCE filed on 08/15/2007 has been acknowledged.

2. Applicants' amendment has required new grounds of rejection. New grounds

rejection are therefore presented in the Office Action.

3. Applicant's arguments have been fully considered but are moot in view of the

new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims **1-4, 6-19 and 21-27** rejected under 35 U.S.C. 103(a) as being

unpatentable over Gruzdev (PGPUB-DOCUMENT-NUMBER: 20030002095) in view of

Higgins US-PAT-NO: 5835627, "System and method for automatically optimizing image quality

and processing time".

() **Regarding Claims 1,16**:

A method for applying an image enhancement algorithm to input digital images

represented in different input color spaces comprising:

a) identifying the input color space of an input digital image;

([0020] on Page 3, "taking an image with colors represented within a color system or

color space; defining a color or range of colors in an image that is to be modified.")

   b) applying a color space transformation to the input digital image represented in

the input color space to form a corresponding input digital image in a reference color

space;

([0020] "converting a representation of this color to a color space."

[0042] "convert the target replacement color specification into a reference color space."

[0043] "source color defined in the same reference color space.")

   c) adjusting one or more algorithm parameters of the image enhancement

algorithm in response to the identified input color space; and

([0043] "adjust to the fact that colors in the reference color space may not lie within the

gamut of possible colors represented by the original color space"

[0020] "converting a representation of this color to a color space." "replacing the hue ...

of this color with a hue selected from a specified target color." Gruzdev is converting a

specific color range and is modifying specific colors.   So, when converting from sRGB

to reference color space, colors outside of sRGB in reference color space are ignored.)

   Gruzdev only discloses applying (replacing) image enhancement algorithm using

the one or more adjusted algorithm parameters ([0020] "replacing...this color". [0043]

"adjust") *to the corresponding input digital image in the reference color space to*

produce an enhanced digital image in the reference color space.

([0020] "replacing the hue and, optionally the saturation or lightness or both of this color

with a hue (and as desired, the saturation and lightness) selected from a specified

target color." He also discloses a program in [0038].

[0043] "adjust to the fact that colors in the reference color space may not lie within the

gamut of possible colors represented by the original color space")

Gruzdev discloses everything as described above except, *automatically applying*

the automatic image enhancement algorithm without user intervention.

Higgins discloses Col12 line 46, "automatic enhancement of images provided by

a wide variety of types of image data" for an image processing system.

It is desirable to implement image enhancement automatically to reduce error,

decrease "processing time", efficiency, automation, ease of use, efficient utilization of

human resources, (Abstract) customer satisfaction. Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention to use Higgins'

method, automatic image enhancement, in Gruzdev, to increase ease of use and

customer satisfaction. Gruzdev's [0038] program can be programmed to do automatic

image enhancement.

() Regarding Claim 2:

The method according to claim 1 wherein the reference color space is an

extended color gamut color space.

([0042] "every color in the original image may be converted to the reference color

space."

[0043] "adjust to the fact that colors in the reference color space may not lie within the

gamut of possible colors represented by the original color space"))

() Regarding Claim 3:

The method according to claim 1 wherein the input color space is a limited color

gamut color space.

([0020] "taking an image with colors represented within a color system or color space,

for instance, in the RGB color space; defining a color or range of colors in an image that

is to be modified;")

() Regarding Claim 4:

The method according to claim 1 wherein the reference color space represents

an estimate of the colors in an original scene.

([0041] "A fourth method of defining the target replacement color is to select it from

another image." "A fifth method of defining the target replacement color is to select it

from the image being modified."

[0042] "convert the target replacement color specification into a reference color space.")

() **Regarding Claim 6:**

The method according to claim 4 wherein the input color space is a video RGB color

space,

(Video RGB is inherent. [0020] "taking an image with colors represented within a color

system or color space, for instance, in the RGB color space; defining a color or range of

colors in an image that is to be modified;")

and wherein the color space transformation is substantially an inverse of a

color adjustment function used to map original scene colors to corresponding colors

appropriate for display on a video display.

([0020] "converting a representation of this color to a color space."

"a look-up table in the original color space to convert the specific colors of the image.")

() **Regarding Claim 7:**

The method according to claim 6 wherein the inverse color adjustment function

produces corresponding input digital images in the reference color space having

reduced highlight color saturation for highlight color values compared with

corresponding original scene colors.

([0020] "replacing the hue and, optionally the saturation or lightness or both of this color

with a hue (and as desired, the saturation and lightness) selected from a specified

target color to form a replacement color; converting the replacement color (as measured

in the second color space format, e.g., hue, saturation and lightness) to the original

color space format.")

() Regarding Claim 8:

The method according to claim 1 further including the step of applying an

output color space transformation to the output digital image in the reference color

space to form a corresponding output digital image in an output color space.

([0020] "converting the replacement color (as measured in the second color space

format, e.g., hue, saturation and lightness) to the original color space format.")

() Regarding Claim 9:

The method according to claim 8 wherein the output color space is the same as

the input color space.

([0020] "converting the replacement color (as measured in the second color space

format, e.g., hue, saturation and lightness) to the original color space format.")

() Regarding Claim 10:

The method according to claim 1 wherein the automatic image enhancement

algorithm is an adaptive tone scale enhancement algorithm.

(ABSTRACT: The color correction device may include a means for creating a tone

reproduction curve based on conceptually moving one or other limit of a range of image

color values in order to provide a tone reproduction curve with improved rendering of

the color correction.

[0021] "FIG. 1 shows a series of tone reproduction curves before and after adjustment"

[0037] "A method is used to provide a tone reproduction curve..."

[0038] "...the program creates a monotonic tone reproduction curve..."

[0039] "The monotonic tone reproduction curve..."

Once the curve is set, tone enhancement is automatic.)

() **Regarding Claim 11**:

The method according to claim 1 wherein the automatic image enhancement

algorithm is a color enhancement algorithm.

(ABSTRACT: "color correction device... improved rendering of the color."

[0011] "a means of correcting a specific color or specific range of colors in an

image."[0011]-[0014].

Color is enhanced automatically, as in Photoshop. This is described further in Claim 1.)

() **Regarding Claim 12**:

The method according to claim 1 wherein the automatic image enhancement

algorithm is a noise reduction algorithm.

([0040] "this reduces the effect of image noise on the definition of the source color."

[0014] modifying specific dark or light colors, or specific ranges of such colors in an image without introducing unpleasant artifacts in the remaining colors of the image or loss of image detail.

Noise reduction is automatic, as in Photoshop.)

() **Regarding Claim 13**:

The method according to claim 1 wherein the automatic image enhancement algorithm is a sharpening algorithm.

(Sharpening is inherent. ABSTRACT: "improved rendering of the color correction."

[0004] "range of colors is rendered correctly."

[0011] "correcting a specific color or specific range of colors in an image wherein remaining colors (e.g., colors and/or ranges of colors outside the scope of the specific color and/or specific range selected) are modified to a degree smaller than the change in the color or color range being corrected."

[0014] "modifying specific dark or light colors, or specific ranges of such colors in an image without introducing unpleasant artifacts in the remaining colors of the image or loss of image detail.")

() **Regarding Claim 14**:

The method according to claim 1 wherein a sequence of automatic image enhancement algorithms are applied to the corresponding input digital image in the reference color space.

([0020] "permitting a definition of hue, lightness and saturation (or their equivalents) if the current color space does not permit this; computing the hue, saturation and lightness of the color in this color space; replacing the hue and, optionally the saturation or lightness or both of this color with a hue (and as desired, the saturation and lightness) selected from a specified target color to form a replacement color; converting the replacement color (as measured in the second color space format, e.g., hue, saturation and lightness.")

() **Regarding Claim 15**:

15. (Currently amended) The method according to claim 1 wherein the one or more algorithm parameters control whether or not a component of the automatic image enhancement algorithm is applied.

([0011] "a means of correcting a specific color or specific range of colors in an image." [0018] "system for modifying a specific color or specific range of colors in an image by providing the operator with a means to prepare and retain a set of replacement colors.")

() **Regarding Claim 17**:

The method according to claim 16 where the reference color space is an extended color gamut color space.

([0042] "every color in the original image may be converted to the reference color space.")

() **Regarding Claim 18**:

The method according to claim 16 where the input color space is a limited color

gamut color space.

([0020] "taking an image with colors represented within a color system or color space,

for instance, in the RGB color space; defining a color or range of colors in an image that

is to be modified;")

() **Regarding Claim 19**:

The method according to claim 16 where the reference color space represents an

estimate of the colors in an original scene.

([0041] "A fourth method of defining the target replacement color is to select it from

another image." "A fifth method of defining the target replacement color is to select it

from the image being modified."

[0042] "convert the target replacement color specification into a reference color space.")

() **Regarding Claim 21**:

The method according to claim 19 where the input color space is a video RGB

color space,

(Video RGB is inherent. [0020] "taking an image with colors represented within a color

system or color space, for instance, in the RGB color space; defining a color or range of

colors in an image that is to be modified;")

and wherein the color space transformation is substantially an inverse of a

color adjustment function used to map original scene colors to corresponding colors

appropriate for display on a video display.

([0020] "converting a representation of this color to a color space."

"a look-up table in the original color space to convert the specific colors of the image.")

() **Regarding Claim 22**:

The method according to claim 21 where the inverse color adjustment function

produces corresponding input digital images in the reference color space having

reduced highlight color saturation for highlight color values compared with

corresponding original scene colors.

([0020] "replacing the hue and, optionally the saturation or lightness or both of this color

with a hue (and as desired, the saturation and lightness) selected from a specified

target color to form a replacement color; converting the replacement color (as measured

in the second color space format, e.g., hue, saturation and lightness) to the original

color space format.")

() **Regarding Claim 23**:

The method according to claim 16 further including the step of applying an

output color space transformation to the output digital image in the reference color

space to form a corresponding output digital image in an output color space.

([0020] "converting the replacement color (as measured in the second color space

format, e.g., hue, saturation and lightness) to the original color space format.")

() **Regarding Claim 24**:

The method according to claim 16 wherein the selected version of the automatic

image enhancement algorithm is an adaptive tone scale enhancement algorithm.

(ABSTRACT: The color correction device may include a means for creating a tone

reproduction curve based on conceptually moving one or other limit of a range of image

color values in order to provide a tone reproduction curve with improved rendering of

the color correction.

[0021] "FIG. 1 shows a series of tone reproduction curves before and after adjustment")

() **Regarding Claim 25**:

The method according to claim 16 wherein the selected version of the automatic

image enhancement algorithm is a color enhancement algorithm.

(ABSTRACT: "color correction device... improved rendering of the color."

[0011] "a means of correcting a specific color or specific range of colors in an image."

[0011]-[0014].)

() **Regarding Claim 26**:

The method according to claim 16 wherein the selected version of the automatic

image enhancement algorithm is a noise reduction algorithm.

([0040] "this reduces the effect of image noise on the definition of the source color."

[0014] modifying specific dark or light colors, or specific ranges of such colors in an image without introducing unpleasant artifacts in the remaining colors of the image or loss of image detail.)

() **Regarding Claim 27:**

The method according to claim 16 wherein the selected version of the automatic image enhancement algorithm is a sharpening algorithm.

(Sharpening is inherent. ABSTRACT: "improved rendering of the color correction."

[0004] "range of colors is rendered correctly."

[0011] "correcting a specific color or specific range of colors in an image wherein remaining colors (e.g., colors and/or ranges of colors outside the scope of the specific color and/or specific range selected) are modified to a degree smaller than the change in the color or color range being corrected."

[0014] "modifying specific dark or light colors, or specific ranges of such colors in an image without introducing unpleasant artifacts in the remaining colors of the image or loss of image detail.")

6.   **Claims 5 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruzdev (PGPUB-DOCUMENT-NUMBER: 20030002095) in view of Higgins US-PAT-NO: 5835627, "System and method for automatically optimizing image quality and processing time" and further in view of Capitant (US-PAT-NO: 5321500).

Gruzdev discloses *input color space represents the colors of a photographic negative.*
([0020] on Page 3, "taking an image with colors represented within a color system or
color space; defining a color or range of colors in an image that is to be modified.")
Gruzdev also discloses, [0020] "constructing a look-up table in the original color space
to convert the specific colors of the image".   However, Gruzdev and Higgins do not
disclose: the color space transformation is an inverse film sensitometry transformation.
Capitant discloses color space transformation is an inverse film sensitometry
transformation. (Column 7, lines 50-55, "film transform section includes logarithm look-
up tables 90, 92, and 94, masking matrix 96, parameter registers 112, and reverse
sensitometry and linearizing look-up tables 98, 101, and 103."
Column 8, line 23-25, "reverse sensitometry.")
As Capitant says in Column 7, lines 36-45, and shows in Figure 6, it may be desirable to
"perform a limited type of color transformation, namely the transformation of the colors
of the digitized images generated by camera processor 12 (as a result of scanning
motion picture film) into colors that would have been generated if the subject had been
imaged directly by a video camera (i.e., without intermediate filming and film scanning
steps)."   Therefore, it would have been obvious to one of ordinary skill in the art at the
time the invention was made to include the method of Capitant, which involves reverse
sensitometry, into a combined method of Gruzdev and Higgins, to digitally color correct
the digitized images from motion picture film (Capitant's column 1, "FIELD OF THE
INVENTION"). Capitant's look up tables can be incorporated into Gruzdev's look up
tables.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Benz (US 20020067518 A1) discloses, "Process and apparatus

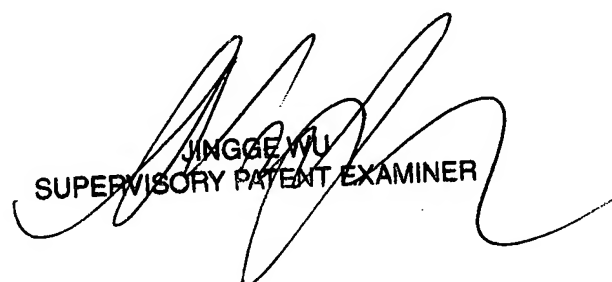for the manufacture of a digital color picture."

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Max Shikhman whose telephone number is (571) 270-

1669. The examiner can normally be reached on Monday-Friday 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, JINGGE WU can be reached on (571) 272-7429. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Max Shikhman

8/24/2007

JINGGE WU
SUPERVISORY PATENT EXAMINER